

ABSTRACT OF THE INVENTION

Apparatus and method for performing laser thermal annealing (LTA) of a substrate using an annealing radiation beam that is not substantially absorbed in the substrate at room temperature. The method takes advantage of the fact that the
5 absorption of long wavelength radiation (1 micron or greater) in some substrates, such as undoped silicon substrates, is a strong function of temperature. The method includes heating the substrate to a critical temperature where the absorption of long-wavelength annealing radiation is substantial, and then irradiating the substrate with the annealing radiation to generate a temperature capable of annealing the substrate.